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## Space Congress Programs

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4-23-1985

# 1985 Twenty-Second Space Congress Program

Canaveral Council of Technical Societies

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Aeronautical University™  
SCHOLARLY COMMONS

# TWENTY-SECOND



# SPACE CONGRESS

# PROGRAM

Cocoa Beach, Florida April 23, 24, 25, 26, 1985

## CHAIRMAN'S MESSAGE

The theme of the **Twenty-Second Space Congress** is **Space and Society — Progress and Promise**. This is appropriate for the maturity of world wide space activities as well as descriptive of the planned program.

Congressman Don Fuqua, Chairman, Committee on Science & Technology will present the keynote address followed by a high level DOD Panel describing multi-service space activities. Today's space program will be further discussed in sessions covering Space Shuttle Operational Efficiency, Spacelab Missions, Getaway Specials, and International Space Programs.



Society is not only more aware but also becoming directly active in Space through Getaway Specials on Shuttle as well as the advent of major activities to be covered in a panel on Commercialization. Other near term new initiatives are covered in panels on Space Defense Initiative and Space Station Plans & Development. More futuristic endeavors are presented in paper sessions on Remote Operations in Space & Robotics, Space Station Technology, and Advanced Missions & Transportation. In addition, Contracts & Management, Productivity and Energy are special interest sessions scheduled.

This four day meeting will include the **Meet The Astronauts** event for the first time at the Kennedy Space Center new Galaxy Theater. In addition to the traditional Banquet and Luncheon there is an added Golf Tournament on the final day.

A special attraction is the performance by Ray Bradbury of his original radio drama "Leviathan 99" on Wednesday evening.

Please join us to share an outstanding program covering Space — a growing frontier which continually changes our perspective and the way we do business on earth.

*Fred W. Haise*

Fred W. Haise  
General Chairman  
Twenty-Second Space Congress

## GENERAL INFORMATION

### HEADQUARTERS/REGISTRATION

Headquarters for the Twenty-Second Space Congress is the Holiday Inn, Cocoa Beach. Registration will take place in the Dolphin Room from noon to 5:00 p.m. Monday, April 22, 1985. Registration will continue from 7:00 a.m. to 5:00 p.m. on Tuesday, Wednesday and Thursday, and from 8:00 a.m. to Noon on Friday.

PACKAGE REGISTRATION . . . . .	\$75.00
(Includes four items listed below)	
Tuesday Banquet . . . . .	20.00
Thursday Luncheon . . . . .	8.00
Bound Copy of Proceedings . . . . .	30.00
Sessions all four days . . . . .	25.00
Individual Sessions . . . . .	5.00
Individual Sessions (Students) . . . . .	2.00

Package registration will save you money; however, each item may be purchased individually at the listed price. Individual papers in the proceedings will be available at a cost of \$.10 per page.

### PRESS ROOM

Press headquarters is in the Pelican Room of the Holiday Inn and is staffed and directed by Pat Oliver from 12 noon to 5:00 p.m. on Monday and from 8:00 a.m. to 5:00 p.m. on Tuesday, Wednesday and Thursday, and 8:00 a.m. to Noon on Friday. The telephone number in the press headquarters is (305) 783-9604.

### MESSAGE/LOCATOR ASSISTANCE

The sponsoring organization, the Canaveral Council of Technical Societies (CCTS), assists attendees by maintaining a message board. Registrants who wish to leave lodging and local phone information can do so by turning in locator forms, available at the Registration Desk, to the CCTS/Message/Locator Desk located in the Dolphin Room, Holiday Inn, or by phone to 799-2182 or 799-2458.

### PROCEEDINGS

The proceedings of the Twenty-Second Space Congress are available at the registration desk in the Holiday Inn during the Space Congress. After the close of the Space Congress, additional proceedings can be purchased for \$35 each plus postage from Secretary, CCTS, Post Office Box 245, Cape Canaveral, Florida 32920.

### EXHIBITS

Exhibits will include displays of the Space Shuttle, Shuttle payloads and communications satellites. The exhibit hall will be open from 11:00 a.m. to 7:00 p.m. on Tuesday, from 11:00 a.m. to 8:00 p.m. on Wednesday, and from 9:00 a.m. to 1:00 p.m. on Thursday. Representatives of the exhibitors will be in attendance to assist and inform visitors. The exhibit hall is located at the Crossway Inn, 3901 N. Atlantic Ave. (A1A), Cocoa Beach.

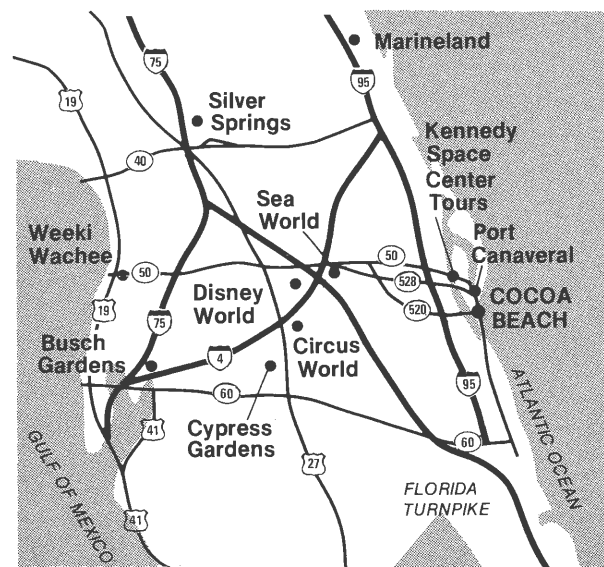
The exhibit center is open to the general public at no charge. A free Shuttle Bus is available on a 30-minute schedule from the registration area, Holiday Inn, to the Beach Theater and the exhibit area in the Crossway Inn.

### EXHIBITORS

Aviation Week  
Boeing Aerospace Co.  
Brevard Community College  
Canaveral Council of Technical Societies  
EG&G Florida, Inc.  
Florida Institute of Technology  
Grumman Corporation  
International Business Machines Corporation  
Lockheed Missiles and Space Co.  
McDonnell Douglas Corporation  
Morton Thiokol Inc.  
Northrop Services, Inc.  
Pan Am World Services, Inc.  
Planning Research Corporation  
Rockwell International Corporation  
TRW Inc.  
U.S. Navy  
United Technologies Corporation  
Wyle Laboratories

### ATTRACTION CENTERS

Late April in Florida is a delightful time of the year for the entire family. The weather is pleasant, the hardy find the Atlantic warm enough for swimming and tourist attractions are not yet crowded, **Cocoa Beach** offers a long stretch of swimming beach, surfing areas, and both deep-sea and shore fishing. Three and four day cruises aboard the **SS Royale** can be enjoyed from Port Canaveral. Bus tours of the **Kennedy Space Center** and **Cape Canaveral Air Force Station** are available from the **SPACEPORT, USA** where a free exhibit-filled space museum can be enjoyed by both children and adults. Within one to two hours drive is a world of vacation fun in the Magic Kingdom of **Walt Disney World** and **Epcot Center** — **Sea World**, one of America's finest marine attractions — the mystery and excitement of Africa in **Busch Gardens** — famed Glass Bottom boats at **Silver Springs** — the beautiful gardens and daily water ski revue with lovely aquamaids at **Cypress Gardens** — see the show and be a performer at **Circus World**.



## YOUTH SCIENCE FAIR

Science fair displays and demonstrations from local secondary school students will be open to the public from 11:00 a.m. to 7:00 p.m. on Tuesday, and 11:00 a.m. to 8:00 p.m. on Wednesday. The Thursday schedule is from 9:00 a.m. to 1:00 p.m. All Youth Science Fair Activities will take place in the Dolphin Room of the Cocoa Beach Holiday Inn. Judging will be conducted from 8:00 a.m. to 12:30 p.m. on Wednesday, April 24. The awards will be presented to the winners at the 8:00 p.m. "Meet the Astronauts" panel session to be held at the Galaxy theater, SPACEPORT, USA (KSC Visitors Information Center), at 7:30 p.m. on Thursday, April 25.

## PIONEERS' DAY

The Pioneers' Banquet '85 will be held on Friday, April 26, at the Officers Open Mess, Patrick Air Force Base.

Speaker: Mr. Bernard J. O'Keefe  
Chairman of the Board, and  
Chief Executive Officer  
EG&G, Inc.

Social Hour 6:30 p.m.  
Dinner 7:30 p.m.

Registration is April 23, 24 and 25 at the Holiday Inn, Cocoa Beach, and 2:00 to 6:30 p.m. at the Officers Open Mess on April 26.

## CANAVERAL COUNCIL OF TECHNICAL SOCIETIES

Air Force Association	American Society for Quality Control
American Institute of Aeronautics and Astronautics	American Welding Society
American Institute of Architects	American Society for Training and Development
American Institute of Industrial Engineers	Armed Forces Communications Electronics Association
American Meteorological Society	Coalition of Aerospace Professional Engineers
American Society of Civil Engineers	Florida Engineering Society
American Society of Heating, Refrigeration and Air Conditioning Engineers	Institute of Electrical and Electronic Engineers
American Society for Industrial Security	Instrument Society of America
American Society of Mechanical Engineers	Missile, Space and Range Pioneers, Inc.
	National Contract Management Association

Society of Photo-Optical Instrumentation Engineers

Society for the Advancement of Materials and Process Engineering

Society of Logistics Engineers

American Society of Safety Engineers

Society for Technical Communication

Many of the societies will have educational/promotional brochures/information on display at the CCTS Desk. Attendees are invited to stop by and review this material.

## SPACE CONGRESS GOLF TOURNAMENT

Golfers can enjoy a tournament on Friday, April 26th at the Cocoa Beach Golf Course Recreation Center, off Minuteman Causeway.

The tournament will be in a four-player, select shot format with an A, B, C, and D player on each team. Teams will be assigned by the tournament committee who will consider requests for preferred teaming. A maximum of 128 players will be registered on a first come first in basis. Lunch, refreshment on the course, green fees, carts, and trophies are included in the fee of \$22. Ask for sign up at Registration Desk. Be at the course as soon after 11:30 a.m. as possible. A shotgun start at 12:30 p.m. will allow completion in time for Pioneers Banquet attendance.

## TWENTY-SECOND SPACE CONGRESS COMMITTEE

GENERAL CHAIRMAN  
*Fred Haise*  
*Grumman Technical Services, Inc.*

VICE CHAIRMAN  
*Jim Johnson*  
*NASA*

FINANCE  
*Bill Macdonald*  
*McDonnell Douglas Astronautics Co.*

ASSISTANT TO CHAIRMAN  
*Joe Klimek*  
*Grumman Technical Services, Inc.*

TECHNICAL PAPERS  
*Ed Andrews*  
*Lockheed Space Operations Co.*

PROGRAM CHAIRMAN  
*Wally Boggs*  
*NASA*

LOCAL ACCOMMODATIONS  
*Gail Galloway*  
*Rockwell International*

SPECIAL ARRANGEMENTS  
*Col. Al Thomas*  
*USAF*

PUBLICATIONS/GRAPHICS  
*Larry Cashion*  
*EG&G*

LOCAL SUPPORT  
*Dick Burns*  
*RCA Service Co.*

PUBLICITY  
*Pat Oliver*  
*McDonnell Douglas Technical Services Co.*

REGISTRATION  
*Jim Beardall*  
*USBI/BPC*

SCIENCE FAIR  
*Dave Murray*  
*Brevard County Schools*

EXHIBITS  
*Warren Green*  
*Boeing Services International*

LEGAL  
*Jere Lober*  
*Attorney, Merritt Island, FL*

RECORDING SECRETARY  
*Charlotte Craft*  
*Grumman Technical Services, Inc.*

CCTS  
*Larry Holley*  
*NASA*

ADVISOR  
*Janet Bonder*  
*PRC Systems Services*

ADVISOR  
*Pres Beck*  
*NASA (Retired)*



## TWENTY-SECOND SPACE CONGRESS PROGRAM

TUESDAY, APRIL 23, 1985

**KEYNOTE ADDRESS (8:30 a.m. to 9:00 a.m.)**  
**Beach Theater**

Opening Remarks: Mr. Fred Haise  
Introduction: Congressman Bill Nelson  
Speaker: Congressman Don Fuqua

Don Fuqua was born in Jacksonville, Florida, graduated from Altha High School and attended the University of Florida from 1951-53. During the Korean war, he served the U. S. Army Medical Corps. He resumed his studies at the University of Florida and graduated with a degree in agricultural economics in 1957.



In 1958, he was elected to the Florida House of Representatives and was re-elected each succeeding congress. A poll conducted by the press, radio, and TV selected him as one of the most valuable members in the 1961 session of the legislature.

The Florida Jaycees named him as one of Five Outstanding Young Men in the State for 1963, and he received the Distinguished Alumnus Award from the University of Florida in 1971.

He is a member of AIAA, AAS, the National Space Club, the Planetary Society, is a member of the National Space Institute Advisory Board, and is a member of numerous other science and technical societies.

He is a member of the Presbyterian Church, American Legion, Elks, Jaycees, W.O.W., Florida Sheriffs Boys Ranch Board of Trustees, Rodeheaver Boys Ranch Trustee, 32d degree Mason, Shrine, Royal Order of Jesters, member of Alpha Gamma Rho and Gamma Sigma Delta, Delta Theta Phi, University of Florida Blue Key, Florida State University Gold Key, and many local, county, and State organizations.

He is the Chairman, Science and Technology Committee, and also ranking majority member of the Government Operations Committee. He is ranking majority member of the Legislation and National Security Subcommittee. He and his wife, Nancy, have two children, Laura and John.

*Bill Nelson serves as a member of the Banking Committee and the Science and Technology Committee in the House of Representatives. He is chairman of the Space Science and Applications Subcommittee. He was elected to the 97th Congress in November 1978 and subsequently re-elected in 1980, 1982, and 1984.*

**PANEL SESSION I (9:00 a.m. to 11:30 a.m.)**  
**Beach Theater**

### DEPARTMENT OF DEFENSE SPACE PROJECTS

Session Chairman: Lieutenant General Forrest S. McCartney, Commander, Space Division, Los Angeles Air Force Station, CA  
Session Organizer: Captain James H. Conlon, Eastern Space and Missile Center, Patrick AFB, FL

#### MEMBERS:

Commodore Richard Truly, Commander, Naval Space Command, Dahlgren, VA  
Colonel Orlando C. Severo, Jr., Commander 6595th Shuttle Test Group, Space and Missile Test Organization, Vandenberg AFB, CA  
Brigadier General Edward P. Barry, Jr., Deputy Commander for Launch and Control Systems, Space Div., Los Angeles AFS, CA  
Colonel Charles E. Heimach, Director of Space, Deputy Chief of Staff, Plans, Space Command, Peterson AFB, CO

### PAPER SESSION I (1:00 p.m. to 4:00 p.m.)

#### A. OPERATIONAL EFFICIENCY IN STS Beach Theater

Session Chairman: Mr. Thomas E. Utsman  
Director of Shuttle Management & Operations  
NASA, John F. Kennedy Space Center, FL  
Session Organizer: Mr. John W. Harden, NASA, Kennedy Space Center, FL

1. STS GROUND OPERATIONS FLOW  
Mr. W. John Denson, Deputy Program Manager, Lockheed Space Operations Company, Kennedy Space Center, FL
2. STS RETRIEVAL OF SATELLITES  
Mr. Tandy N. Bruce, Senior Payload Officer, Payload Operations Support Branch, Johnson Space Center, Houston, TX
3. THE CASE FOR A CENTRALIZED REPAIR DEPOT FOR SPACE SHUTTLE  
Mr. Roger D. Enlow, NASA, Chief, Operational Logistics Division, Launch Support Services Directorate, Kennedy Space Center, FL
4. COST EFFECTIVE LAUNCH OPERATIONS FOR THE SSME  
Mr. Frank Klatt, Manager, SSME Advanced Programs, Rocketdyne Division, Rockwell International, Canoga Park, CA
5. THE UPGRADE OF FORECAST WEATHER SUPPORT TO STS OPERATIONS  
Major Thomas M. Meyers, USAF and Mr. Billy F. Boyd, Staff Meteorologists, Patrick Air Force Base, FL
6. OPERATIONAL EFFICIENCY IN STS CARGO PROCESSING  
Mr. Robert E. Wilson, Manager, Cargo Requirements and Integration, Lockheed Space Operations Company, Kennedy Space Center, FL
7. LOGISTICS SUPPORT ECONOMY AND EFFICIENCY THROUGH CONSOLIDATION AND AUTOMATION

Mr. George R. Savage, Director, Logistics, Mr. C. J. Fontana, Manager, Plans, Systems and Audit, and Mr. J. D. Custer, Supervisor, Plans and Control, Lockheed Space Operations Company, Kennedy Space Center, FL

## **B. REMOTE OPERATION IN SPACE AND ROBOTICS**

### **Holiday Inn, Manatee Rooms A&B**

Session Chairman: Dr. David Flinchbaugh

Senior Staff Specialist  
McDonnell Douglas Astronautics Co.  
Titusville, FL

Session Organizer: Mr. Robert J. Kearney, Kearney Consultants, Orlando, FL

1. **ADVANCED MANIPULATOR SYSTEM REQUIREMENTS AND CONCEPTS FOR SPACE STATION**  
Mr. Pramod Kumar, Mr. Savi Sachdev and Mr. Eric Quittner, SPAR Aerospace, Ltd. Ontario, Canada.
2. **ALTERNATIVES FOR REMOTE SPACE STATION MAINTENANCE**  
Dr. Margaret M. Clarke, Space Station Systems Division, Rockwell International Corporation, Downey, CA
3. **AN ORBITAL MANEUVERING VEHICLE SIMULATOR**  
Mr. Thomas Braun, Mr. Fred Roe, NASA, Marshall Space Flight Center, AL and Dr. William Teoh, University of Alabama, Huntsville, AL
4. **ADVANCES IN TELEPRESENCE TECHNOLOGY**  
Dr. Kevin Corker, Bolt, Beranek & Newman, Cambridge, MA  
Dr. Antal Bejczy, Jet Propulsion Laboratory, Pasadena, CA
5. **NUCLEAR POWER REQUIREMENTS FOR AUTOMATED AND SEMI-AUTOMATED LUNAR OPERATIONS**  
Mr. David Buden, Science Applications International Corp., Albuquerque, NM  
Dr. Joseph A. Angelo, Jr., Space Technology Program, Florida Institute of Technology, Melbourne, FL
6. **A KNOWLEDGE BASED EXPERT SYSTEM FOR PROPELLANT SYSTEM MONITORING AT KSC**  
Mr. John R. Jamieson, NASA, Kennedy Space Center, FL  
Dr. Ethan Scarle, Mitre Corp., Bedford, MA  
Dr. Carl DeLaune, NASA, Kennedy Space Center, FL

## **C. CONTRACTING AND MANAGEMENT**

### **Holiday Inn, Manatee Rooms C&D**

Session Chairman: Rear Admiral Stuart J. Evans, USN (Retired)

Assistant Administrator for Procurement  
NASA Headquarters, Washington, D.C.

Session Organizer: Mr. Fred H. Van Dyck, CPCM, McDonnell Douglas Technical Services Co., Kennedy Space Center, FL

1. **INITIATION OF THE NEXT STEP: THE ACQUISITION OF A SPACE STATION PROGRAM**  
Dr. Thomas G. Mancuso, Manager, Management Integration Office, Space Station Projects Office, Johnson Space Center, TX
2. **MOTIVATIONAL CONTRACTING FOR SPACE PROGRAMS: GOVERNMENT AND INDUSTRY PERSPECTIVES**  
Mr. Daniel R. Clough, Shuttle Division Chief-Procurement, Marshall Space Flight Center, AL

## **3. CONTRACTOR TEAMING AGREEMENTS**

Mr. Eli Rapaich, Manager of Contracts, Federal Systems Division, TRW, Inc., Redondo Beach, CA

## **4. DATA RIGHTS — COMPUTER SOFTWARE AND TECHNICAL DATA DEVELOPED UNDER DOD CONTRACT**

Mr. Gary D. Ciavola, Contracts and Administration, SOFTECH, Inc., Waltham, MA

## **5. SUPPORT SERVICE CONTRACTING**

Mr. Philip F. Whitaker, Government Contracting Consultant, Murphy, Perlman, and Sarkis, Melbourne, FL. (Retired Supervisory Contracts Specialist, NASA Kennedy Space Center, FL)

## **SPACE CONGRESS BANQUET**

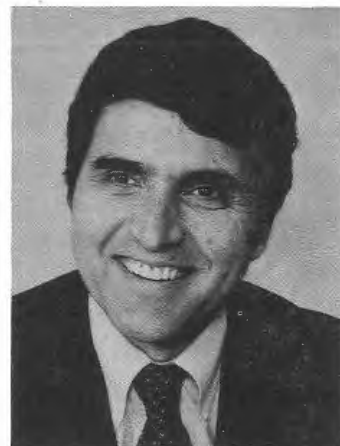
### **Officer's Club, Patrick Air Force Base**

Cocktails: 7:00 p.m. to 8:00 p.m.  
Banquet: 8:00 p.m.

Introduction: Mr. Fred Haise

Speaker: Dr. Harrison H. Schmitt, Apollo Astronaut  
Former U.S. Senator

Harrison H. Schmitt was born in New Mexico and attended public schools there. He received a B.S. degree from California Institute of Technology in 1957, was a Fulbright student at the University of Oslo (Norway) from 1957 to 1958, and received a Doctorate in Geology from Harvard University in 1964. He was a teaching fellow, Harvard University in 1961 and a National Science Foundation Postdoctorate Fellow at Harvard University in 1964.



He came to NASA in 1965 and was the backup lunar module pilot for Apollo 15. His first journey into space was in 1972 aboard the Apollo 17 mission to the Moon. In February 1974, he became the Chief of Scientist-Astronauts, and in May of that year was appointed NASA Assistant Administrator for Energy Programs.

Dr. Schmitt received the Arthur S. Fleming award in 1973, the NASA Distinguished Service Award, and has been the recipient of numerous professional and academic awards.

He is a member of the Geological Society of America, American Geophysical Union, American Association for the Advancement of Science, American Association of Petroleum Geologists, Ameri-

can Institute of Aeronautics and Astronautics, Norwegian Geographical Society, Sigma Xi, and the Navy League. He resigned from NASA in August 1975 and returned to New Mexico to enter politics, and was elected to the U.S. Senate in November 1976 for a 6-year term beginning January 1977.

He is currently an aerospace consultant living in Albuquerque.

He is currently a member of the President's Foreign Intelligence Advisory Board and the National Strategic Materials and Mineral's Program Advisory Committee. He is also an advisor to the Department of Defense on the Strategic Defense Initiative.

## WEDNESDAY, APRIL 24, 1985

### PANEL SESSION II (8:30 a.m. to 11:30 a.m.) Beach Theater

#### STRATEGIC DEFENSE INITIATIVE

Session Chairman: Lt.Gen. James A. Abrahamson, USAF, Director, Strategic Defense Initiative Organization, Office of the Secretary of Defense, Washington, D.C.

Session Organizer: Col. Fred Sawyer, USA, SDIO, OSD, Washington, D.C.

#### MEMBERS

Dr. Lou Marquet, Director, Directed Energy Weapons, SDIO, OSD, Washington, D.C.

Col. Mal O'Neill, USA, Director, Kinetic Energy Weapons, SDIO, OSD, Washington, D.C.

Dr. Bill Fredrick, Acting Director, Sensors Office, SDIO, OSD, Washington, D.C.

Col. George Hess, USAF, Director, Survivability, Lethality, and Key Technologies, SDIO, OSD, Washington, D.C.

### LUNCHEON (11:45 a.m.) Holiday Inn, Manatee Room

Introduction: Mr. Fred Haise

Speaker: Mr. Ray Bradbury  
Noted Author, Producer, Director

Ray Bradbury grew up in Waukegan, Illinois, where entranced with magicians, comic strips and science fiction magazine covers, he began to write at the age of twelve. He graduated from high school in 1938, but did not attend college, rather educating himself by spending three to five days a week in the Los Angeles Library reading books from all the rooms there. He "graduated" from the library there at the age of twenty seven, by which time he had written several million words. From then to now, he writes at least one short story per week or its equivalent in poetry, essays, plays or novels.



Ray Bradbury has written one thousand or more short stories of which some four hundred have appeared in such magazines as the New Yorker, Harper's, The New Republic, McCall's, Mademoiselle, Woman's Day, and Seventeen. His stories are in one thousand school text anthologies from junior high through universities, and are in two thousand other anthologies.

He wrote for radio programs including "Suspense" and "CBS Radio Playhouse", and wrote television scripts for "Twilight Zone" and "Alfred Hitchcock Presents".

He formed his own theatre group to write and produce plays based on his stories.

Films have been made from his FAHRENHEIT 451, THE ILLUS-TRATED MAN, THE MARTIAN CHRONICLES, ANY FRIEND OF NICHOLAS NICKLEBY'S IS A FRIEND OF MINE, THE ELECTRIC GRANDMOTHER, THE PICASSO SUMMER, and, most recently, SOMETHING WICKED THIS WAY COMES, for which Bradbury wrote the screenplay. His first screen work was the script of MOBY DICK written for director John Huston, starring Gregory Peck, released in theatres in 1956.

He is now working on the libretto of a future-world opera, LEVIATHAN 99, a collection of stories on Ireland titled GREEN and revising his murder mystery DEATH IS A LONELY BUSINESS, to be published in October of 1985.

### PAPER SESSION II (2:30 p.m. to 5:30 p.m.)

#### A. SPACE SYSTEMS TECHNOLOGY Beach Theater

Session Chairman: Mr. Paul F. Holloway

Deputy Director, NASA  
Langley Research Center, Hampton, VA

Session Organizer: Mr. James M. Spears, NASA, Kennedy Space Center, FL

1. ENABLING TECHNOLOGIES FOR SPACE-BASED RESOURCES AND OPERATIONS  
Mr. R. Sadin, Assistant Deputy Director, Office of the Director for Space, OAST, NASA Headquarters, Washington, D.C.
2. DYNAMIC POWER — A KEY TO THE PROMISE OF SPACE,  
Mr. Clifford N. Hall, Vice-President, General Manager, Sustrand Energy Systems, and Mr. Jerome P. Mullin, Vice-President — Research, Sustrand Advanced Technology Group, Rockford, IL
3. DEPLOYABLE OR ERECTABLE SPACE STATION STRUCTURE — DECISION FOR 1985  
Mr. I. F. Victor and Mr. H. S. Greenberg, Space Station Systems Division, Rockwell International, Downey, CA
4. COMMERCE LAB: A PROGRAM OF COMMERCIAL FLIGHT OPPORTUNITIES  
Mr. Harry L. Atkins, Manager, Commercial User Development, Program Development, NASA Marshall Space Flight Center, AL, and Mr. Jack Robertson, Director, Research and Engineering, Wyle Laboratories, Huntsville, AL
5. ON-ORBIT PROPELLANT RESUPPLY DEMONSTRATION — PRELIMINARY FLIGHT RESULTS  
Mr. James Tegart and Mr. Zack Kirkland, Martin Marietta Corporation, Denver, CO



6. SOLAR ORBITAL TRANSFER VEHICLE CONCEPT  
Mr. Steven A. Mickler, Mickler and Associates, Alpharetta, GA

**B. SPACELAB MISSION RESULTS**  
**Holiday Inn, Manatee Rooms A&B**

Session Co-Chairman: Mr. Michael J. Sander  
Manager, Flight Project Support Office  
Jet Propulsion Laboratory, Pasadena, CA

Session Co-Chairman: Mr. Hans Hoffmann  
Senior Vice President, Marketing  
MBB/ERNO

Bremen, Germany  
Session Organizer: Mr. Berend Koerber, MMB-ERNO, Kennedy  
Space Center, FL

1. SPACELAB ONE — AN ON ORBIT PERSPECTIVE  
Dr. Owen K. Garriott, NASA, Johnson Space Center, TX
2. SPACE LIFE SCIENCES ONE MISSION  
Dr. Bill Williams, MATSCO, Houston, TX
3. COMMERCE LAB — SPACELAB AS A COMMERCIAL  
SUPPORT SYSTEM  
Dr. Dale Christensen, Wyle Laboratories, Huntsville, AL
4. ULTRAVIOLET ASTRONOMY USING THE ASTRO  
OBSERVATORY ABOARD THE SPACE SHUTTLE  
Dr. Arthur Davidson, Department of Physics, Johns Hopkins  
University, Baltimore, MD
5. SPACELAB ONE RESULTS  
Dr. Charles R. Chappell, NASA, Marshall Space Flight Center,  
AL
6. SPACELAB THREE MISSION  
George H. Fichtl, C. Kelly Hill and Otha H. Vaughan, NASA,  
Marshall Space Flight Center, AL
7. D-1 PAYLOAD OPERATIONS  
Hans Joachin Panitz, DFVLR, Porz/Wahn, Germany
8. SPACELAB PAYLOAD INTEGRATION IN EUROPE  
Werner Riesselmann, MBB/ERNO, Bremen, Germany
9. BENEFITS OF SPACELAB FOR RESEARCH IN MICRO-  
GRAVITY  
Ulrich Huth, DFVLR, Washington, D.C. Office

**C. ADVANCED MISSIONS AND TRANSPORTATION**  
**Holiday Inn, Manatee Rooms C&D**

Session Chairman: Dr. Ivan Bekey  
Director, Advanced Programs, Officer of Space Flt.  
NASA Headquarters, Washington, D.C.

Session Organizer: Mr. David C. Moja, NASA, Kennedy Space  
Center, FL

1. SHUTTLE DERIVED LAUNCH VEHICLE EVOLUTION  
Mr. B. W. Shelton/Chief, Systems Integration Branch, NASA,  
Marshall Space Flight Center, AL
2. PERFORMANCE INCREASES FOR THE IUS BY MEANS OF  
USING A SPACE TETHER  
Mr. Gregory G. Ryan/ Design Engineer, IUS Futures, Boeing  
Aerospace Co., Seattle, WA

3. PROPELLANT TRANSPORTATION TO SPACE  
Mr. D. Fester/Manager, Space Fluid Systems, Martin Marietta  
Aerospace, Denver, CO

4. THE ORBITAL MANEUVERING VEHICLE  
Mr. W. G. Huber/Manager, Orbital Maneuvering Vehicle Task  
Team, NASA/Marshall Space Flight Center, AL

5. A POTENTIAL LUNAR BASE  
Mr. M. B. Duke/Chief, Solar System Exploration Division,  
NASA/Johnson Space Center, TX

**EXHIBIT CENTER COCKTAIL RECEPTION**  
**(6:00 to 7:30 p.m.)**

**Crossway Inn Convention Center**

Complimentary drink tickets will be distributed on Tuesday.

**SPECIAL FEATURE (8:30 p.m. to 9:30 p.m.)**  
**Beach Theater**

Radio Drama "LEVIATHAN 99"  
Ray Bradbury

**THURSDAY, APRIL 25, 1985**

**PANEL SESSION III (8:00 a.m. to 11:30 a.m.)**  
**Beach Theater**

**COMMERCIALIZATION**

Session Chairman: Mr. Isaac T. Gillam, IV  
Assistant Administrator For Commercial Programs, NASA  
Headquarters, Washington, D.C.  
Session Organizer: Mr. Donald J. Capone, NASA, Kennedy Space  
Center, FL

**MEMBERS:**

Mr. Robert Hood, McDonnell Douglas Astronautics Co., Huntington  
Beach, CA  
Mr. David Grimes, Transpace Carriers, Inc., Greenbelt, MD  
Dr. Chris Podsiadly, 3M Corporation, St. Paul, MN  
Mr. Mike Martin, Rockwell International, Downey, CA  
Mr. Chet Lee, Office of Space Flight, NASA Headquarters,  
Washington, D.C.

**PAPER SESSION III (1:00 p.m. to 4:00 p.m.)**

**A. SPACE STATION TECHNOLOGY**  
**Beach Theater**

Session Chairman: Mr. Richard F. Carlisle  
Deputy Director for Engineering, Space Station Program Office,  
NASA Headquarters, Washington, D.C.  
Session Organizer: Mr. Raymond J. Cerrato, NASA, Kennedy Space  
Center, FL

1. APPLICATION OF SOLIDS MODELING TECHNOLOGY TO SPACE STATION CONCEPTUAL DESIGN & ON-ORBIT ASSEMBLY  
Mr. Robert R. York, Staff Engineer, and Mr. Stephen B. Rider, Senior Engineer, Space Station Project, Martin-Marietta Aerospace, Denver, CO
2. POWER & THERMAL MANAGEMENT OF FREE FLYING PLATFORMS FOR THE SPACE STATION ERA  
Dr. Harold O. Curtis, Mgr. Work Package 3 Space Station Definition & Prelim. Design, RCA Astro Electronics, Princeton, NJ
3. EVOLUTIONARY PATHS FOR ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN OPERATOR INTERACTIONS WITH SPACE STATION ROBOTS  
Mr. Ronald A. Hammond, Robotics Center, and Dr. Douglas C. Durrrough, Manager, Real Time Systems Research, Boeing Computer Services Company, Bellevue, WA, and Mr. D. Paul Meyer, Technical Leader, Automation and Robotic System, Space Station Technology, Boeing Aerospace Co., Seattle, WA
4. HIGH LEVERAGE ADVANCED DEVELOPMENT PROJECTS TO MEET SPACE STATION REQUIREMENTS  
Dr. R. M. Wood, Advanced Development Director, Space Station Program, McDonnell Douglas Astronautics Co., Huntington Beach, CA
5. PROPULSION SYSTEM CONCEPT ASSESSMENT AND TECHNOLOGY REQUIREMENTS FOR THE SPACE STATION  
Mr. William F. Rector III, Vice President, Space Station, and Mr. M. W. Hewley, Preliminary Design Engineer, Advanced Space System, General Dynamics, San Diego, CA
6. SPACE STATION POWER SYSTEM TECHNOLOGY ISSUES & DEVELOPMENT APPROACH  
Mr. J. M. Friefeld, Mr. G. J. Hallinan, & Mr. T. H. Springer, Rockwell International Rocketdyne Division, Canoga Park, CA

## **B. INTERNATIONAL PROGRAMS** **Holiday Inn, Manatee Rooms A&B**

Session Co-Chairman: Prof. Ernesto Vallerani,  
Director, Space Sector  
Aeritalia G.S.S.  
Turin, Italy

Session Co-Chairman: Dr. Dwight J. Easterly  
Manager, Test Engineering  
Hipparcos Program  
TRW/Aeritalia G.S.S.  
Turin, Italy

Session Organizer: Mr. Jose Gonzalez, NASA Kennedy Space Center, FL., (Retired)

1. INTERNATIONALIZATION OF THE SPACE STATION  
Mr. Robert V. Lottmann, Chief, Cooperative Programs Branch, Policy & Plans Office, Office of Space Station, NASA Headquarters, Washington, D.C.
2. EUROPE "en route" TOWARD SPACE STATION  
M. Jean-Louis Collette, Program Coordinator, Space Transportation Systems Division, ESA, Paris, France

3. SPACE STATION ADAPTABILITY TO TETHER APPLICATIONS  
Dr. Paul A. Penzo, Mission Design Section, Jet Propulsion Laboratory, Pasadena, CA
4. THE HIPPARCOS PROGRAM — MAPPING OF THE STARS  
Dr. Dwight J. Easterly, Hipparcos-Test Engineering, Manager, TRW/ Aeritalia G.S.S., Turin, Italy  
Mr. Giuseppe Morsillo, Hipparcos — System Test Engineering Aeritalia G.S.S., Turin, Italy
5. GIOTTO: EUROPE'S EXPLORATORY SPACECRAFT MISSION TO COMET HALLEY  
Mr. David Link, Program Manager, Giotto Spacecraft, Dynamics Group, Space & Communications Division, British Aerospace, Bristol, England.
6. THE FAINT OBJECT CAMERA  
Mr. C. Gricourt, Head of Scientific Instrument Department, MATRA Space Branch, Toulouse, France

## **C. PRODUCTIVITY IN SPACE ACTIVITIES** **Holiday Inn, Manatee Rooms C&D**

Session Chairman: Mr. Robert L. Vaughn, Director of Productivity, Lockheed Missile and Space Co., Inc., Sunnyvale, CA

Session Organizer: Mr. Harry D. Bowman, Director, Lockheed Space Operations Co., Kennedy Space Center, FL

1. NASA PRODUCTIVITY IMPROVEMENT & QUALITY ENHANCEMENT PROGRAM  
Mr. David R. Braunstein, Director, NASA Productivity Programs, NASA Headquarters, Washington, D.C.
2. SPACE STATION HUMAN PRODUCTIVITY STUDY  
Mr. Wayne R. Gonzalez, Study Manager, Astronautics Division, Lockheed Missiles & Space Company, Inc., Sunnyvale, CA
3. MANAGEMENT INFORMATION SYSTEMS IN SPACE  
Dr. David S. Wehrly, Manager, Engineering/Scientific Systems and Advanced Technology, IBM Corporation ESSAT, Endicott, NY
4. TRW'S SPACE PRODUCTIVITY PROGRAM  
Mr. Edward A. Steigerwald, Vice President, Productivity — Science & Technology, TRW, Inc., Cleveland, OH
5. ROLE OF THE TECHNOLOGIST IN SPACE PRODUCTIVITY  
Dr. Keith E. McKee, Director, Manufacturing Productivity Center, IIT Research Institute, Chicago, IL
6. PRODUCTIVITY FOR HIGH RELIABILITY SPACE PRODUCTS  
Ms. Mary E. Nickerson, Manager, Productivity & Organizational Development, Hughes Aircraft Company, Space & Communications Group, Los Angeles, CA

## **PANEL SESSION IV (7:30 p.m. to 9:30 p.m.)** **Galaxy Theater — SPACEPORT USA**

### **MEET THE ASTRONAUTS**

Session Chairman: Mr. Richard G. Smith, Center, Director, NASA, Kennedy Space Center, FL

A panel open to the general public with several astronauts and payload specialists discussing present and future activities for men and women in space.

Science Fair winners will be presented awards.

## FRIDAY, APRIL 26, 1985

### PANEL SESSION V (8:30 a.m. to 11:30 a.m.) Beach Theater

#### SPACE STATION

Session Chairman: Mr. Neil Hutchinson, Program Manager for Space Station, NASA, Johnson Space Center, TX

Session Organizer: Mr. Bob Gunter, NASA, Kennedy Space Center, FL

#### MEMBERS:

Mr. Jacques Collet, Head of Long Term Planning Office, Directorate of Space Transportation, ESA, Paris, France

Dr. Karl Doetsch, Associate Director, National Aeronautics Establishment, Ottawa, Ontario, Canada

Dr. Takuya Ara, Director, Space Experiments Group, National Space Development Agency, Tokyo, Japan

Dr. Peter Banks, Head, Telecommunications and Radio Sciences Lab, Stanford University, Palo Alto, CA

Mr. John Eagen, Manager, Business Planning Group, Coopers and Lybrand, Washington, D.C.

Mr. William Schneider, Vice President-Development, Systems Sciences Div., Computer Sciences Corporation, Silver Spring, MD

### PAPER SESSION IV (12:45 p.m. to 3:00 p.m.)

#### A. GETAWAY SPECIAL PROGRAM Holiday Inn, Manatee Rooms A&B

Session Chairman: Mr. James A. Ralph, Manager, Cargo Operations Analysis, IBM Corporation, Kennedy Space Center, FL

Session Organizer: Mr. Dean Zimmerman, NASA, Kennedy Space Center, FL

1. CURRENT UNIVERSITY PROGRAMS:  
Mr. James A. Ralph, IBM

2. GETAWAY SPECIAL PROGRAM EVOLUTION:  
Mr. R. Gilbert Moore, Special Projects, Manager For Space Programs, Morton-Thiokol, Wasatch Division, Brigham City, UT

3. SPACELAB HITCHHIKER FOR RAPID, LOW COST, ORBITAL APPLICATIONS:  
Mr. Ed James, Manager, Spacelab Hitchhiker Program, NASA Headquarters, Washington, D.C.

4. "STARWORMS", GETAWAY SPECIAL NUMBER 263, A PROGRESS REPORT  
Ms. Dena Rashkover, Principal Investigator, Pioneer Middle School, Cooper City, FL

5. LOGO CONTEST AWARDS  
Mr. James A. Ralph, IBM

## B. ENERGY TOPICS Holiday Inn, Manatee Rooms C&D

Session Chairman: Dr. David A. Block, Director, Florida Solar Energy Center, Cape Canaveral, FL

Session Organizer: Mr. Philip W. Fahey, Florida Solar Energy Center, Cape Canaveral, FL

1. SOLAR ENERGY FEASIBILITY STUDY: LOW-HEAD HIGH-VOLUME PUMPING IN SOUTH FLORIDA  
Mr. Henry M. Healey, Principal Engineer, Florida Solar Energy Center, Cape Canaveral, FL
2. HYDROGEN PRODUCTION FROM SALT WATER BY MARINE BLUE-GREEN ALGAE AND SOLAR RADIATION  
Dr. Akira Mitsui, Professor, University of Miami, Rosenstiel School of Marine and Atmospheric Science, Miami, FL
3. PROGRAM ACTIVITIES: FLORIDA SOLAR ENERGY CENTER  
Ms. Ingrid Melody, Public Information Director, Florida Solar Energy Center, Cape Canaveral, FL
4. ENERGY FROM LOW TEMPERATURE DIFFERENCES  
Mr. Brian Parsons, Solar Energy Research Institute, Golden, CO

### SPACE CONGRESS GOLF TOURNAMENT (12:30 p.m. to 5:00 p.m.)

Cocoa Beach Golf Course — Recreation Department off Minuteman Causeway

### PIONEERS ANNUAL BANQUET (6:30 p.m.) Patrick AFB, Officer's Open Mess

6:30 Social Hour

7:30 Dinner

## PROGRAM SUMMARY

### MONDAY, April 22

12:00 noon to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

### TUESDAY, April 23

7:00 a.m. to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

8:30 a.m. KEYNOTE ADDRESS  
Beach Theater

9:00 a.m. to 11:30 a.m. PANEL SESSION I — DEPARTMENT OF DEFENSE PROJECTS  
Beach Theater

11:00 a.m. to 7:00 p.m. YOUTH SCIENCE FAIR  
Holiday Inn Dolphin Room

11:00 a.m. to 7:00 p.m. EXHIBITS  
Crossway Inn Convention Center

1:00 p.m. to 4:00 p.m. PAPER SESSION I:  
A. OPERATIONAL EFFICIENCY PROGRAMS IN STS  
Beach Theater

B. REMOTE OPERATION IN SPACE AND ROBOTICS  
Holiday Inn Manatee Rooms A&B

C. CONTRACTING AND MANAGEMENT  
Holiday Inn Manatee Rooms C&D

7:00 p.m. BANQUET SOCIAL HOUR  
Patrick Air Force Base, Officers Open Mess

8:00 p.m. BANQUET  
Patrick Air Force Base, Officers Open Mess

#### WEDNESDAY, April 24

7:00 a.m. to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

8:30 a.m. to 11:30 a.m. PANEL SESSION II — STRATEGIC DEFENSE INITIATIVE  
Beach Theater

11:00 a.m. to 8:00 p.m. YOUTH SCIENCE FAIR  
Holiday Inn Dolphin Room

11:00 a.m. to 8:00 p.m. EXHIBITS  
Crossway Inn Convention Center

11:45 a.m. to 1:00 p.m. SPACE CONGRESS LUNCHEON  
Holiday Inn Manatee Rooms

2:30 p.m. to 5:30 p.m. PAPER SESSIONS II:  
A. SPACE SYSTEM TECHNOLOGY  
Beach Theater

B. SPACELAB MISSION RESULTS  
Holiday Inn Manatee Rooms A&B

C. ADVANCED MISSIONS AND TRANSPORTATION  
Holiday Inn Manatee Rooms C&D

6:00 p.m. to 7:30 p.m. EXHIBIT CENTER COCKTAIL RECEPTION  
Crossway Inn Convention Center

8:30 p.m. to 9:30 p.m. SPECIAL FEATURE — RADIO DRAMA  
Ray Bradbury performing his "LEVIATHAN 99"  
Beach Theater

#### THURSDAY, April 25

7:00 a.m. to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

8:30 a.m. to 11:30 a.m. PANEL SESSION III — COMMERCIALIZATION  
Beach Theater

9:00 a.m. to 1:00 p.m. YOUTH SCIENCE FAIR  
Holiday Inn Dolphin Room

9:00 a.m. to 1:00 p.m. EXHIBITS  
Crossway Inn Convention Center

1:00 p.m. to 4:00 p.m. PAPER SESSION III:  
A. SPACE STATION TECHNOLOGY  
Beach Theater

B. INTERNATIONAL PROGRAMS  
Holiday Inn Manatee Rooms A&B

C. PRODUCTIVITY IN SPACE ACTIVITIES  
Holiday Inn Manatee Rooms C&D

7:30 p.m. to 9:30 p.m. PANEL SESSION IV — MEET THE ASTRONAUTS  
Galaxy Theater—SPACEPORT USA  
(KSC Visitor's Information Center)

#### FRIDAY, April 26

8:00 a.m. to 12:00 noon REGISTRATION DESK OPEN

8:30 a.m. to 11:30 a.m. PANEL SESSION V — SPACE STATION  
Beach Theater

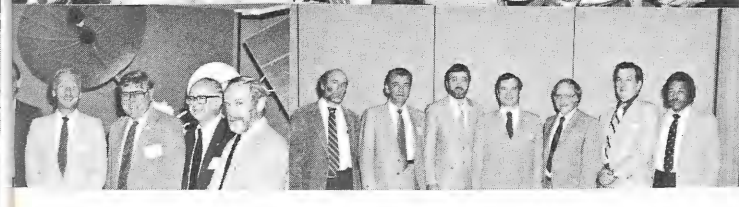
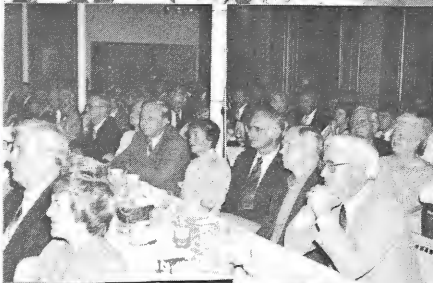
12:30 p.m. to 5:00 p.m. SPACE CONGRESS GOLF TOURNAMENT  
Cocoa Beach Golf Course

12:45 p.m. to 3:00 p.m. PAPER SESSION IV  
A. GETWAY SPECIAL PROGRAM  
Holiday Inn — Manatee Rooms A&B

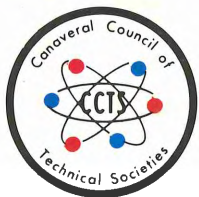
B. ENERGY TOPICS  
Holiday Inn — Manatee Rooms C&D

6:30 p.m. MISSILE, SPACE, AND RANGE PIONEERS' ANNUAL BANQUET  
Patrick Air Force Base, Officers Open Mess





NOTES



**TWENTY-SECOND SPACE CONGRESS**  
**Post Office Box 245**  
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